

COPY #7  
Rwanda Patent 29 OCT 2002  
Originally Filed

We claim:

1. The use of DNA sequences coding for a  
5 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) for producing  
plants with increased tocopherol, vitamin K, chlorophyll  
and/or carotenoid contents.
2. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 or of  
10 a DNA sequence which hybridizes with the latter and codes for  
a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS) for  
producing plants with increased content of tocopherols,  
vitamin K, chlorophylls and/or carotenoids.
- 15 3. The use of DNA sequences coding for a  
1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and coding for  
a p-hydroxyphenylpyruvate dioxygenase (HPPD) for producing  
plants with increased tocopherol, vitamin K, chlorophyll  
and/or carotenoid contents.
- 20 4. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and of  
a DNA sequence SEQ ID No. 5 or of a DNA sequence which  
hybridizes with the latter and codes for a  
1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and a  
25 p-hydroxyphenylpyruvate dioxygenase for producing plants with  
increased content of tocopherols, vitamin K, chlorophylls  
and/or carotenoids.
- 30 5. The use of DNA sequences coding for a  
1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and coding for  
a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for  
producing plants with increased tocopherol, vitamin K,  
chlorophyll and/or carotenoid contents.
- 35 6. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and of  
a DNA sequence SEQ ID No. 7 or of a DNA sequence which  
hybridizes with the latter and codes for a  
1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and a  
geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for  
40 producing plants with increased tocopherol, vitamin K,  
chlorophyll and/or carotenoid contents.
7. The use of DNA sequences coding for a  
1-deoxy-D-xylulose-5-phosphate synthase (DOXS) and coding for  
45 a hydroxyphenylpyruvate dioxygenase (HPPD) and coding for a  
geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for

producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents.

8. The use of a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and of a DNA sequence SEQ ID No. 5 and of a DNA sequence SEQ ID No. 7 or of a DNA sequence which hybridizes with the latter and codes for a 1-deoxy-D-xylulose-5-phosphate synthase (DOXS), a hydroxyphenylpyruvate dioxygenase (HPPD) and a geranylgeranyl-pyrophosphate oxidoreductase (GGPPOR) for producing plants with increased content of tocopherols, vitamin K, chlorophylls and/or carotenoids.
9. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 or a DNA sequence which hybridizes with the latter in plants.
10. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and a DNA sequence SEQ ID No. 5 or DNA sequences which hybridize with the latter in plants.
11. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 and a DNA sequence SEQ ID No. 7 or DNA sequences which hybridize with the latter in plants.
12. A process for producing plants with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents, which comprises expressing DNA sequences SEQ ID No. 1 or SEQ ID No. 3, SEQ ID No. 5 and SEQ ID No. 7 or DNA sequences which hybridize with the latter in plants.
13. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.
14. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and DNA sequences SEQ ID No. 1 or SEQ ID No. 3 and SEQ ID No. 5

50

into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.

15. A process for transforming a plant, which comprises  
5 introducing an expression cassette comprising a promoter and DNA sequences SEQ ID No. 1 or SEQ ID No. 3 and SEQ ID No. 7 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.

10 16. A process for transforming a plant, which comprises introducing an expression cassette comprising a promoter and DNA sequences SEQ ID No. 1 or SEQ ID No. 3, SEQ ID No. 5 and SEQ ID No. 7 into a plant cell, into callus tissue, a whole plant or protoplasts of plant cells.

15 17. A process for transforming plants as claimed in claim 13-16, wherein the transformation takes place with the aid of the strain *Agrobacterium tumefaciens*, of electroporation or of the particle bombardment method.

20 18. A plant with increased tocopherol, vitamin K, chlorophyll and/or carotenoid contents comprising an expression cassette as set forth in claim 13-16.

25 19. A plant as claimed in claim [lacuna] selected from the group of soybean, canola, barley, oats, wheat, oilseed rape, corn or sunflower.

20. The use of SEQ ID No. 1 or SEQ-ID No. 3 for producing a test  
30 system for identifying DOXS inhibitors

21. A test system based on the expression of an expression cassette as set forth in claim 13 for identifying DOXS inhibitors.

35 22. The use of a plant comprising a DNA sequence SEQ ID No. 1 or SEQ ID No. 3 or a DNA sequence which hybridize with the latter for producing plant and bacterial DOXS.

40

45